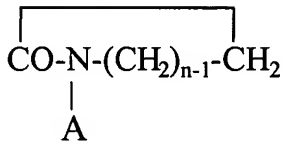
AMENDMENT TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application.

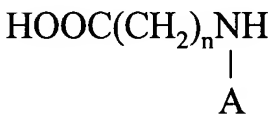
Listing of Claims:

1-10. Cancelled

11. (New) A toughened nylon that comprises a matrix nylon and a long-chain nylon. The matrix nylon is prepared by the homopolymerization or copolymerization of cyclic lactam monomers or their corresponding amino acids. The structure of said cyclic lactam is represented by Formula (I) and the structure of said amino acid is represented by Formula (I').



(I)



(I')

In Formula (I) and (I') A is H or alkyl with 1-8 carbon and $3 \leq n \leq 11$.

The long-chain nylon is selected from nylons that contain repeating units having structures represented by Formula (II), (III) or (IV).

$$(\text{-NH-D-NH-CO-E-CO-})_p \qquad \text{(II)}$$

In Formula (II) D is $-(CH_2)_x-$, in which H may be substituted with C_{1-4} alkyl optionally; E is $-(CH_2)_y-$ or phenylene, in which H may be substituted with C_{1-4} alkyl optionally; $4 \leq x \leq 34$ and $4 \leq y \leq 34$.

$$(\text{-NH-}(CH_2)_w\text{-CO-})_p \qquad \text{(III)}$$

In Formula (III), $7 \leq w \leq 34$□

$$(\text{-NH-}(CH_2)_u\text{-CO-NH-}(CH_2)_v\text{-CO-})_p \quad \text{(IV)}$$

In Formula (IV) $5 \leq u \leq 34$□$5 \leq v \leq 34$□and $u \neq v$.

The proportion of said long-chain nylon in the total weight of toughened nylon is 2-45 %. As the toughened nylon has very good interface combination and only one melting peak is detected with differential scanning calorimetry.

12. (New) A toughened nylon according to Claim 11 wherein the proportion of said long-chain nylon used as toughening agent in the total weight of toughened nylon is 6-25%.

13. (New) A toughened nylon according to Claim 11, wherein said cyclic lactam monomer is selected from one or more following monomers: butanolactam, pentanolactam, hexanolactam, heptanolactam, octanolactam, nonanolactam, decanolactam, undecanolactam, dodecanolactam, N-methyl hexanolactam, N-n-octyl nonanolactam, N-t-butyl dodecanolactam□said corresponding amino acid is ω-amino butanoic acid, ω-amino pentanoic acid, ω-amino hexanoic acid, ω-amino heptnoic acid, ω-amino octanoic acid, ω-amino nonanoic acid, ω-amino decanoic acid, ω-amino undecanoic acid or ω-amino dodecanoic acid; the long-chain nylon is selected from one or more following nylons: nylon-1010, nylon-1111, nylon-1212, nylon-1313, nylon-46, nylon-66, nylon-610, nylon-612, nylon-613, nylon-1011, nylon-1012, nylon-1213, nylon-8, nylon-9, nylon-11, nylon-12, nylon-13, poly(telephtaloyl-2,2,4-trimethyl hexamethylene diamine), poly(3-t-butyl-hexanedioyl heptamethylene diamine), co-condensation nylon 6/7, co-condensation nylon 6/10, co-condensation nylon 6/12, co-condensation nylon 6/13, co-condensation nylon 10/11, co-condensation nylon 10/12, co-condensation nylon 12/13, nylon-6T and nylon-10T.

14. (New) A preparation process of toughened nylon according to Claim 11 wherein the steps of process are as follows:

Dissolve said long-chain nylon resin in said lactam monomer or its corresponding amino acid;

The polymerization of said lactam monomer or its corresponding amino acid is carried out;

The dissolution step and the polymerization step may be conducted simultaneously, or dissolve at first and then carry out polymerization in the solution obtained.

15. (New) A process according to Claim 14 wherein said polymerization may be carried out with any such process as casting, reacting extrusion, hydrolysis polymerization or solid phase polymerization.

16. (New) A process according to Claim 15 wherein the following steps are conducted: dissolve said long-chain nylon resin in melted cyclic lactam monomer or its corresponding amino acid; dehydrate; then add catalyst and dehydrate again, raise temperature to 120-200° C and add catalyst promoter; transfer in a preheated mould immediately and carry out polymerization in an oven at 150-250° C to obtain toughened nylon.

17. (New) A process according to Claim 15 wherein the following steps are conducted:

add and dissolve said long-chain nylon resin in cyclic lactam monomer or its corresponding amino acid in a reactor; dehydrate in vacuum; add catalyst and continue to dehydrate in vacuum;

in another reactor add cyclic lactam monomer or its corresponding amino acid and catalyst promoter, dehydrating in vacuum.

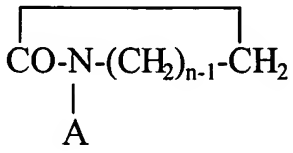
add the contents of two reactors into an extruder for polymerization; set the temperature of polymerization section at 220-250°C and adjust screw speed so that the residence time of material in screw is 0.5–7 minutes, and toughened nylon is obtained as extruded product.

18. (New) A process according to Claim 15 wherein the following steps are conducted: add said long-chain nylon resin to cyclic lactam monomer or its corresponding amino acid, heat and dissolve, add water and conduct hydrolysis polymerization at 200-250°C and 10-20 MPa, depressurize after 0.5-6 hours and dehydrate in vacuum; continue polymerization for further increasing viscosity and then toughened nylon is obtained.

19. (New) The application of toughened nylon prepared according to Claim 11 in the manufacture of gears, bearings, precise instrumental parts and automobile parts.

20. (New) A toughened nylon that comprises a matrix nylon and a long-chain nylon. The matrix nylon is prepared by the homopolymerization or copolymerization of cyclic lactam

monomers or their corresponding amino acids. The structure of said cyclic lactam is represented by Formula (I) and the structure of said amino acid is represented by Formula (I').



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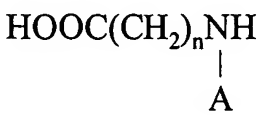

(I')

In Formula (I) and (I') A is H or alkyl with 1-8 carbon and $3 \leq n \leq 11$.

The long-chain nylon is selected from nylons that contain repeating units having structures represented by Formula (II), (III) or (IV).

$$(\text{-NH-D-NH-CO-E-CO-})_p \qquad \text{(II)}$$

In Formula (II) D is $-(CH_2)_x-$, in which H may be substituted with C_{1-4} alkyl optionally ; E is $-(CH_2)_y-$ or phenylene, in which H may be substituted with C_{1-4} alkyl optionally; $4 \leq x \leq 34$ and $4 \leq y \leq 34$.

$$(\text{-NH-}(CH_2)_w\text{-CO-})_p \qquad \text{(III)}$$

In Formula (III), $7 \leq w \leq 34$□

$$(\text{-NH-}(CH_2)_u\text{-CO-NH-}(CH_2)_v\text{-CO-})_p \quad \text{(IV)}$$

In Formula (IV)□$5 \leq u \leq 34$□$5 \leq v \leq 34$□and $u \neq v$.

This toughened nylon is prepared by the polymerization of said cyclic lactam monomer in the existence of said long-chain nylon as toughening agent. The proportion of said long-chain nylon used as toughening agent in the total weight of toughened nylon is 2-45%.

21. (New) A toughened nylon according to Claim 20 wherein the proportion of said long-chain nylon used as toughening agent in the total weight of toughened nylon is 6-25%.

22. (New) A toughened nylon according to Claim 20, wherein said cyclic lactam monomer is selected from one or more following monomers: butanolactam, pentanolactam, hexanolactam, heptanolactam, octanolactam, nonanolactam, decanolactam, undecanolactam, dodecanolactam,

N-methyl hexanolactam, N-n-octyl nonanolactam, N-t-butyl dodecanolactam□said corresponding amino acid is ω-amino butanoic acid, ω-amino pentanoic acid, ω-amino hexanoic acid, ω-amino heptnoic acid, ω-amino octanoic acid, ω-amino nonanoic acid, ω-amino decanoic acid, ω-amino undecanoic acid or ω-amino dodecanoic acid; the long-chain nylon is selected from one or more following nylons: nylon-1010, nylon-1111, nylon-1212, nylon-1313, nylon-46, nylon-66, nylon-610, nylon-612, nylon-613, nylon-1011, nylon-1012, nylon-1213, nylon-8, nylon-9, nylon-11, nylon-12, nylon-13, poly(telephtaloyl-2,2,4-trimethyl hexamethylene diamine), poly(3-t-butyl-hexanedioyl heptamethylene diamine), co-condensation nylon 6/7, co-condensation nylon 6/10, co-condensation nylon 6/12, co-condensation nylon 6/13, co-condensation nylon 10/11, co-condensation nylon 10/12, co-condensation nylon 12/13, nylon-6T and nylon-10T.

23. (New) A preparation process of toughened nylon according to Claim 20 wherein the steps of process are as follows:

Dissolve said long-chain nylon resin in said lactam monomer or its corresponding amino acid;

The polymerization of said lactam monomer or its corresponding amino acid is carried out;

The dissolution step and the polymerization step may be conducted simultaneously, or dissolve at first and then carry out polymerization in the solution obtained.

24. (New) A process according to Claim 23 wherein said polymerization may be carried out with any such process as casting, reacting extrusion, hydrolysis polymerization or solid phase polymerization.

25. (New) A process according to Claim 24 wherein the following steps are conducted: dissolve said long-chain nylon resin in melted cyclic lactam monomer or its corresponding amino acid; dehydrate; then add catalyst and dehydrate again, raise temperature to 120-200° C and add catalyst promoter; transfer in a preheated mould immediately and carry out polymerization in an oven at 150-250° C to obtain toughened nylon.

26. (New) A process according to Claim 24 wherein the following steps are conducted:

add and dissolve said long-chain nylon resin in cyclic lactam monomer or its corresponding amino acid in a reactor; dehydrate in vacuum; add catalyst and continue to dehydrate in vacuum;

in another reactor add cyclic lactam monomer or its corresponding amino acid and catalyst promoter, dehydrating in vacuum.

add the contents of two reactors into an extruder for polymerization; set the temperature of polymerization section at 220-250°C and adjust screw speed so that the residence time of material in screw is 0.5–7 minutes, and toughened nylon is obtained as extruded product.

27. (New) A process according to Claim 24 wherein the following steps are conducted: add said long-chain nylon resin to cyclic lactam monomer or its corresponding amino acid, heat and dissolve, add water and conduct hydrolysis polymerization at 200-250°C and 10-20 MPa, depressurize after 0.5-6 hours and dehydrate in vacuum; continue polymerization for further increasing viscosity and then toughened nylon is obtained.

28. (New) The application of toughened nylon prepared according to Claim 20 in the manufacture of gears, bearings, precise instrumental parts and automobile parts.